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EXAMINER

REDDING, THOMAS M

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/804,965	Applicant(s) ALBERTELLI ET AL.	
	Examiner Thomas M. Redding	Art Unit 2624	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11/2/2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Amendment*

Applicant's response received on 11/2/2007 is fully considered herein. Claims 1-24 are currently pending.

#### ***Claim Rejections - 35 USC § 101 (repeated from previous office action)***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in Sec. 101.

... a signal does not fall within one of the four statutory classes of Sec. 101.

... signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of Sec. 101.

Claims 18-24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. While claim 18 and its dependent claims 19-24 recite a "computer usable medium", the specification states "Common forms of computer-readable or usable media include, for example, a floppy disk, a carrier wave, or any other medium from which a computer can read" in the specification at paragraph 25. While "functional descriptive material" may be claimed as a statutory

product (i.e., a "manufacture") when embodied on a tangible computer readable medium, a carrier wave embodying that same functional descriptive material is neither a process (i.e., a series of steps per se.) nor a product (i.e., a tangible "thing") and therefore does not fall within one of the four statutory classes of § 101. Rather, "signal" is a form of energy, in the absence of any physical structure or tangible material.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 4-9, 11-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Drisko et al. (US 5,933,523).

Regarding claims 1, 11 and 18, Drisko working in the same problem solving area of identifying a rectangular region, teaches [a] method for detecting corners of a region ("In determining the location of the device, the corners of the device may be identified", Drisko, column 3, line 44), the method comprising the steps of:

detecting edges interior to a region of interest ( "At 302, thresholding is performed on the subsampled image data, and boundary features of the subsampled

image are extracted.”, Drisko, column 5, line 53 and fig 3, and 4B, Drisko’s Region of Interest is the full view of the camera);

culling the detected edges in order to obtain a reduced edge group from the detected edges, the reduced edge group comprising a plurality of points (Drisko, figure 4C and 4D, figure 5, block 503 – Remove Known Nozzle Points)

selecting a plurality of candidate corner points (Drisko, Figures 4C and 4D); and

detecting region corner points from the plurality of candidate corner points based on a predetermined relationship between each of the candidate corner points and characteristic edge points of the region of interest (Drisko, figure 5, block 502 – “Determine Extents”, Drisko’s region of interest is the full camera frame. Drisko teaches a local coordinate system that is fixed relative to the camera frame, which would include the corners and edges of his ROI. Distances are measured with respect to this coordinate system (minX, maxX, etc...). Therefore Drisko does detect corner points that are based on predetermined relationships with the corners and edges of the frame (ROI) as minimum and maximum points will still be minimum or maximum as measured from any point in the coordinate system (i.e. offsets change, but the relationship does not).)

Regarding claims 2, 12 and 19, Drisko teaches the elements of claim 1 as given above wherein the step of detecting edges further comprises the step of applying an edge detection filter to an image of the region of interest (“a boundary feature extraction method is employed to identify boundary features”, Drisko, column 6, line 13, and “an edge detector followed by a filter which detect edge contrast of illumination change”, Drisko, column 6, line 28)

Regarding claims 4 and 14, Drisko teaches the elements of claim 1 as given above. Drisko further teaches the step of selecting a plurality of candidate corner points comprises the steps of:

obtaining a measure of corneriness for each one point from the plurality of points (Drisko, column 6, lines 42-50);

selecting the plurality of candidate corner points from the plurality of points by applying a predetermined criterion (“Once corresponding features are identified, they are fit against model input 414D”, Drisko, column 6, line 55).

Regarding claims 5, 13 and 20, Drisko teaches wherein the step of culling the detected edges further comprises the step of masking selected areas interior to the region of interest (“At 503, nozzle information is used to remove corner points

corresponding to known nozzle points. Nozzle information may be in the form of a model, or a list of points in the physical or image space. Conventional techniques such as masking or point-by-point comparison may be used to identify and remove corner points corresponding to the nozzle at this stage. Similarly, information related to other objects known to show up in the image may be used to remove corner points believed to correspond to those objects” Drisko, column 9, line 23).

Regarding claims 6, 15 and 21; Drisko teaches the method of claim 4 (as described above) wherein the step of selecting a plurality of candidate corner points further comprises the steps of:

comparing the measure of cornerness for each one point from the plurality of points to a predetermined threshold (“Geographic features are calculated with respect to the remaining corner points and compared against model constraints”, Drisko, column 9, line 37);

selecting a point from the plurality of points as a candidate corner point if the measure of cornerness for said point is substantially equal to or greater than the predetermined threshold (“Corner points corresponding to geometric features falling outside of the model constraints are discarded”, Drisko, column 9, line 39).

Regarding claim 7 and 22, Drisko teaches the region of interest is a substantially rectangular region of interest (Drisko, figure 7, Drisko’s region of interest is the full view of the camera which is typically rectangular).

Regarding claims 8, 16 and 23, Drisko teaches determining, for each candidate corner point from the plurality of candidate corner points, a distance from said each candidate corner point to at least one characteristic edge point from a plurality of characteristic edge points of the substantially rectangular region of interest ("In this algorithm,  $x_{\min}$ ,  $x_{\max}$ ,  $y_{\min}$  and  $y_{\max}$  correspond to extents in the extents coordinate space. The index  $\text{maxX.sub\_i}$  corresponds to the upper right corner of the chip, that given by  $\text{minX.sub\_i}$  to the lower left corner, that given by  $\text{maxY.sub\_i}$  to the upper left, and the that given by  $\text{minY.sub\_i}$  to the lower right.", Drisko, column 9, line 9); and wherein said predetermined relationship comprises said distance.

Regarding claim 9, 17 and 24, Drisko teaches [t]he method of claim 8 further comprising the step of: determining whether the region is substantially located at an angle in relation to the substantially rectangular region of interest ("the illustrated CPL process may be used to determine other criteria such as the pose" and "The pose includes at least one of scaling parameters, rotational orientation, translation parameters, deformation parameters, morphing parameters, or any other transformational parameters", Drisko, column 9, line 62-67).

Regarding claims 18-24, Drisko additionally teaches a computer usable medium having computer readable code embodied therein, the computer readable code ("In

general, when implemented as a program or in part as a program, the program can be encoded on any computer-readable medium", Drisko, column 4, line 40).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drisko et al. (5,933,523) and Yokoi (US 2001/0022854 A1).

Regarding claim 3, Drisko teaches the elements of claim 1 and also teaches the use of a filter to detect edges ("an edge detector followed by a filter which detect edge contrast or illumination change" Drisko, column 6, line 28). Drisko does not specifically teach an edge detection filter [that] comprises a Laplacian filter.

Yokoi, working in the same field of endeavor of address label processing ("a recognition apparatus for recognizing sorting information as a character string written within a cellophane region or label region of a paper-like material", Yokoi, paragraph 12 and Figs 3 and 6), does teach an edge detection filter [that] comprises a Laplacian filter ("The image [an edge component image] can be created by applying an operator of



Sobel, operator of Robinson, operator of Kirsch or Laplacian filter to the image of the paper-like material S", Yokoi, paragraph 60).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to use the Laplacian filter of Yokoi, as the "filter which detects edge contrast" as required by Drisko, because of the Laplacian's ability to create an edge component image (Yokoi, paragraph 60), thus fulfilling Drisko's need. The use of a Laplacian filter has long been well known in the art as an efficient, reliable and very predictable device for detecting edges within an image.

Regarding claim 10, Drisko teaches the elements of claim 1 given above. Drisko does not describe applying his technique where the region is an address label on a delivery item.

Yokoi, does teach a recognition system which recognizes a region where the region is an address label on a delivery item ("a recognition apparatus and recognition method for recognizing sorting information (destination address) as a character string written within a cellophane region or label region of a paper-like material, for example, a postal matter and a paper-like material processing apparatus and paper-like material processing method for sorting and processing the paper-like material based on the sorting information recognized by the recognition apparatus." Yokoi, paragraph 2, also figure 6-9).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to use the corner locating system of Drisko to process an

address label on a delivery item, in order to ignore extraneous elements on the items such as dirt or parts of the handling system ("One object of the present invention is to provide a system that detects article position using imaging techniques that reduce the effects of features in an image which do not correspond to the article." Drisko, column 3, line 16). It also provides a means for determining orientation.

### ***Response to Arguments***

1. Applicant's arguments filed 11/2/2007 have been fully considered but they are not persuasive.

**Summary of Applicant's Remarks:** Claims 18-24 should be allowable as patentable subject matter under 35 USC 101 as case law and the proposed interim guidelines all indicate a signal containing functional descriptive material is similar to a computer-readable memory encoded with functional descriptive material (see applicant's response pages 10 - 16).

**Examiner's Response:** Applicants arguments regarding the 35 U.S.C. 101 rejection have been considered and are moot in view of *In re Petrus A.C.M. Nuijten*; Fed Cir, 2006-1371, 9/20/2007, which is the basis for the current office policy.

Claims 18-24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 18, and claims 19-24 by dependency, is drawn to functional descriptive material recorded on a computer usable medium having computer readable code embodied therein. Normally, the claim would be statutory. However, the specification, at page 11 defines the claimed computer readable medium as encompassing statutory media such as a "ROM", "hard drive", "optical drive", "punch cards", "paper tape", etc, as well as ***non-statutory*** subject matter such as a "signal" ("a carrier wave" )

"A transitory, propagating signal ... is not a "process, machine, manufacture, or composition of matter." Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter." (*In re Petrus A.C.M. Nuijten*; Fed Cir, 2006-1371, 9/20/2007).

Because the full scope of the claim as properly read in light of the disclosure encompasses non-statutory subject matter, the claim as a whole is non-statutory. The examiner suggests amending the claim to include the disclosed tangible computer readable media, while at the same time excluding the intangible media such as signals, carrier waves, etc. Any amendment to the claim should be commensurate with its corresponding disclosure.

**Summary of Applicant's Remarks:** Regarding claim 11, the limitations of claim 11 invoke 35 USC 112 paragraph 6. Drisko does not disclose structures equivalent to structures in the specification.

**Examiner's Response:** The structure disclosed by the applicant is described in applicant's specification in paragraph 7. "A system that implements the method of this invention includes one or more processors and one or more memories having computer code that causes the processor to execute the method of this invention". It is this structure that provides the means for each of the defined software elements in claim 11.

Drisko describes an equivalent structure ("As shown in FIG. 3B, a typical image processor 304 includes an input device such as a camera 306. The image processor 304 also includes a processor such as CPU 308 and memory 310. The processor 308 may be a special purpose image processor or it may be a general purpose processor", Drisko, column 4, line 25 and figure 3B).

**Summary of Applicant's Remarks:** Regarding claims 1 and 18, Drisko discloses removing corner points but does not disclose culling detected edges. Drisko also does not disclose "detecting region corner points from the plurality of candidate corner points based on a predetermined relationship between each of the candidate corner points and characteristic edge points".

**Examiner's Response:** Drisko does teach culling the detected edges in order to obtain a reduced edge group from the detected edges, the reduced edge group comprising a plurality of points; Drisko teaches "a boundary feature extraction method is employed to identify boundary features along each surface of each region in the threshold image, as shown in FIG. 4C which shows the boundary 410C of region 401B (of FIG. 4B) and the boundary 412C of region 402B (of FIG. 4B)", (Drisko, column 6, line 13), Drisko is removing or culling points from the edge of the boundaries found in an earlier step. As seen in figure 4C, the extracted boundary features are a "reduced edge group comprising a plurality of points".

If the applicant's intent is to cull entire edges rather than points within the edge, examiner suggests amending the claim to that effect including changing the final clause to indicate "a reduced edge group comprising a plurality of edges". However, even this would require further search and consideration of the prior art.

Drisko also teaches detecting region corner points from the plurality of candidate corner points based on a predetermined relationship between each of the candidate corner points and characteristic edge points. Drisko teaches "Geographic features are calculated with respect to the remaining corner points and compared against model constraints (at 505). Corner points corresponding to geometric features falling outside of the model constraints are discarded. For instance, corner point E4 is discarded in FIG.

6D because the distances from E4 to other corner points were not within the range defined by the model input.”, (Drisko, column 9, line 37). Drisko determines a set of corner points from a larger set, his candidate corner points, by comparing against model constraints, Drisko’s model, describing the anticipated rectangle, provides a set of characteristic edge points.

**Summary of Applicant’s Remarks:** Regarding claims 4 and 14, Drisko does not apply or disclose the concept of corner strength (A.K.A “cornerness” as would be understood by one of ordinary skill in the art of image processing/computer vision.

**Examiner’s Response:** The specification does not make a special definition of corner strength, it only provides examples of specific cornerness algorithms, “Exemplary measures of cornerness include, but are not limited to, the measures defined by Beus and Tiu, Kitchen and Rosenfeld, Freeman and Davis, Rosenfeld and Johnston, Rosenfeld and Weszka, and Zuniga and Haralick” (specification page 4). Claims 4 and 14 do not specify any particular cornerness algorithm. Therefore the corner strength element cited in the claim can be interpreted broadly. Any algorithm that determines corners, ranking one point over its neighbors would meet the limitation. Drisko teaches a simple method of determining corners by ranking candidate points by distance (“These extents are determined by minimum and maximum x and y positions of all the boundary points in the extents coordinate space”, Drisko, column 8, line 49). The final determinations are points that are selected on the min and max distances relative to an

axis. Drisko's algorithm provides a means of determining the corneriness of the points in the restricted point set.

If the applicant's intent is to claim specific corneriness algorithms, examiner suggests amending to construct claims citing specific algorithms. Alternatively, if the applicant intends to specify a class of corneriness algorithms, amend the claim to cite the specific elements required.

**Summary of Applicant's Remarks:** Regarding claims 5, 13, and 20, since Drisko does not disclose "detecting region corner points from the plurality of candidate corner points based on a predetermined relationship between each of the candidate corner points and characteristic edge points" as indicated above, Drisko does not disclose the added limitations of claims 5, 13 and 20.

**Examiner's Response:** Drisko does teach determining "detecting region corner points from the plurality of candidate corner points based on a predetermined relationship between each of the candidate corner points and characteristic edge points" as indicated above. Consequently, the original rejections of claims 5, 13 and 20 are maintained.

**Summary of Applicant's Remarks:** Regarding claims 8, 16 and 23, based on previous comments. Drisko does not disclose the added limitation of claims 8, 16 and 23.

**Examiner's Response:** Claims 8 and 16 depend from claim 1 and 11 which are addressed above. The original rejections of claims 8 and 16 are maintained. Claim 23 depends from claim 18 which is addressed above. The original rejections for claims 8, 16 and 23 are maintained.

**Summary of Applicant's Remarks:** Claims 2, 4-9 depend on claim 1, claims 12-17 are dependent on claim 11, and claims 19-24 depend on claim 18, thus claims 1-2, 4-9 and 11-24 are not anticipated by Drisko.

**Examiner's Response:** The rejections for claims 1, 11 and 18 are all explained above. The original rejections for claims 2, 4-9, claims 12-17 and 19-24 are maintained.

**Summary of Applicant's Remarks:** Regarding claims 3 and 10, as they are dependent upon claim 1 and Drisko does not disclose the elements of claims 1, claims 3 and 10 are not anticipated by the combination of Drisko and Yokoi.



**Examiner's Response:** The rejection for claim 1 is explained above. The original rejections of claims 3 and 10 are maintained.

### ***Conclusion***

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas M. Redding whose telephone number is (571) 270-1579. The examiner can normally be reached on Mon - Fri 7:30 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:  
10/804,965  
Art Unit: 2624

Page 17

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/TMR/

A handwritten signature in black ink, appearing to be 'B. Werner', with a stylized flourish at the end.

**BRIAN WERNER**  
**SUPERVISORY PATENT EXAMINER**